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COMMONWEALTH PHYTOPATHOLOGICAL NEWS

A QUARTERLY REVIEW OF NEWS AND VIEWS ISSUED BY THE COMMONWEALTH MYCOLOGICAL INSTITUTE, KEW, SURREY

MAIN ITEMS

Plant Bacteriology
Aerial Spraying
Buller Memorial
Overseas News
From Near and Far
Personal News

THE PRESENT POSITION OF BACTERIAL PLANT DISEASES

And Subjects for Future Research

by W. J. Dowson

All the authentic bacterial diseases of plants described, recorded, and investigated since the 80's of the last century are still with us. Not one has been completely eradicated except in a few isolated areas, e. g. citrus canker in South Africa and in the Northern Territories of Australia, and that only by the primitive and drastic but effective method of burning. In addition to those which have been known for some time new ones are constantly appearing.

Many bacterial diseases are only kept under control by repeated seasonal measures such as cutting out and spraying though some promising results have been obtained on experimental areas by the application of antibiotics such as streptomycin, e. g. pear blight in America and the silvering of beets in England. In some countries the exclusion of certain diseases has been effected by rigid quarantine measures, e. g. tobacco wildfire which has not yet entered Australia, nor have potato ring rot or pear blight been introduced into Britain.

In Britain and overseas, blackleg of potatoes is still serious in spite of much research work and we do not yet know exactly how the disease is conveyed from one place to another. Are the bacteria on or in the seed tubers? They may be in both places. It has been shown recently that the temperature at which infection can take place through wounds is a decisive factor, and because of the lower average temperature in Scotland only one strain of the pathogen will cause infection in that country. Strains isolated in England and overseas will not bring about infection in Scotland but all strains will cause infection when brough further south where the average spring temperature is higher. Quite recently it has been discovered that soft rot and blackleg can be caused by hitherto unknown green-fluorescent bacteria present in soil.

Other serious diseases in Britain are cherry canker, watermark disease of willow, and poplar canker. Cherry canker has been the subject of intensive re-

search for many years but a perfect control has yet to be devised and will depend upon a fuller knowledge of the characters and activities of the pathogen and also of the response of the host, researches on which are being actively pursued at East Malling.

We do not yet know how the watermark disease of the cricket bat willow is conveyed from tree to tree. Various wood-inhabiting insects and even certain birds have been suspected, and now there is some evidence that the bacteria may be water-borne. Sets for planting showing no signs of disease but taken from infected stools are certainly responsible for the introduction of the disease in some areas and the same is probably true of poplar canker, but this does not explain how neighbouring trees become infected. It may be by bacteria in rainsplash penetrating insect emergence holes.

Overseas bacterial plant diseases are both more numerous and important as much larger areas of plants are affected, e. g. sugarcane, which is seriously damaged and often rendered useless by some five leaf stripe diseases present to a greater or lesser extent in almost every country in which sugarcane is grown. A good deal of confusion exists about the pathogens concerned in these diseases and about the symptoms they cause — symptoms which at one stage of growth of the cane or at another are very similar. In certain areas at least one of the older diseases such as the gumming disease has been almost eradicated, but not quite, for it has reappeared in Natal and in the West Indies. Some sugarcane varieties are resistant to the scald disease in Mauritius but are susceptible in the West Indies and the strains of the pathogens from the two areas differ slightly in their physiological characters. Both strains will produce the symptoms of scald in the Mauritius variety of sugarcane at Cambridge.

Bacterial blight of cotton due to Xanthomonas malvacearum still causes concern in Africa and Asia in spite of much work on control, including seed disinfection and the breeding of resistant varieties — varieties which though resistant in one area appear to be susceptible in an other, suggesting different strains of pathogen.

Reference has been made above to the occurrence of new diseases, examples of which are halo blight of coffee in Brazil, a systemic disease of rice in Hungary, a root rot and wilt of cotton near Aden, and a killing disease of sugarcane in Queensland. The characters, so far known, of the bacterium responsible for the coffee and rice diseases closely resemble those of Pseudomonas syringae, one of the relatively few bacterial plant pathogens capable of attacking a large number of hosts under natural conditions. The new sugarcane disease in Queensland, known as bacterial mottle, has been shown to be caused by a species of Pectobacterium (Erwinia), which can also infect some grasses from which it may have originated. This pathogen has an optimum temperature of about 37°C., in which respect it is like the brown rot and slime disease bacterium, Pseudomonas solanacearum, which has an even wider range than Ps. syringae and may be responsible for the root rot and wilt of cotton at Abyan near Aden. The incidence of this cotton disease, its rapid spread under wet soil conditions at certain seasons, and its isolation from diseased cotton in the area are in accordance with the type of disease produced by Ps. solanacearum.

A heart rot of pineapple in Malaya has been shown to be due to the soft rot bacterium, Pectobacterium carotovorum, a special form of which causes the stalk rot of maize in the Sudan and in Southern Rhodesia. In Queeensland again a hitherto unrecorded disease of French beans called pod twist has been investigated and is due to a new spceies of Pseudomonas called Ps. flectens.

Diseases rare in some countries because of the paucity of host plants are important in others where the hosts are more numerous, e. g. walnut blight is rare in Britain but is common in Tasmania where the trees are grown chiefly as windbreaks to apple orchards.

Suggestions for Future Research

Identification of pathogens: The recognition by specific phages is urged which entails the isolation on the spot of the phages concerned as has been done in Canada with pea and bean blights. The method has proved most useful, especially where only small amounts of infected material are available, and could well be extended to include other plant diseases. A Commonwealth Collection of phages which keep indefinitely should be available to all pathologists concerned with the bacterial dis-

eases of plants.

Diseases of individual crops: More information is needed, for example, on the extent of the stripe diseases of sugarcane and also of the host range of the responsible pathogens. A detailed survey should be undertaken in all countries where this crop is grown followed by the planting of all varieties in an isolated area much in the same way as poplars are tested for resistance or susceptibility to canker in England. It has been suggested that the island of Tobago in the West Indies would be a suitable place.

The part played by wind-blown dust and debris of cotton in the dissemination of bacterial blight (angular leaf spot and black arm) over long distances should be further explored.

Diseases affecting many different plants: Further investigations are needed of the soft rots generally and black leg of potatoes in particular. In certain instances the bacterium must be introduced into the vascular system causing at first wilting, followed by a soft rot of the cortical tissue.

The activities of the brown rot or slime disease pathogen, Pseudomonas solanacearum and its varieties, need more research, especially the host range, e.g. tobacco in Rhodesia is said to be attacked by a specific strain of the organism which also infects other members of the Solanaceae, whereas a strain which infects some Solanaceae will not infect tobacco. It has been shown recently that the mucoid (slimy) type of colony on certain media is virulent but that the drier colony type is not pathogenic or only weakly so.

Seed-borne diseases: It would be advantageous to know what actual tissues of the seed are infected, e.g. of cereals, the elucidation of which might lead to more efficient measures of disinfection.

Water-borne diseases: Further research seems desirable on the manner in which water plays a part in the dissemination of bacterial diseases, e.g. lucerne wilt, the Abyan root rot of cotton, and black leg of potato.

Control and eradication: As mentioned above, complete eradication has been successful only in a few instances, by employing very drastic measures. A great many diseases are kept under control by spraying and cultural operations, e.g. judicious cutting out and attention to drainage. Cereal diseases present a different problem and are being tackled by breeding varieties resistant to the new biologic races of the pathogens which are constantly appearing. More attention might be directed to the origin of these biologic races. Where do they arise — in a cultivated crop or from some wild plant in the bush? If the origin of new biologic races could be traced to wild plants it might be possible to eradicate these from an area surrounding the cultivated crop. The gumming disease of sugarcane was at one time eliminated in Mauritius by introducing resistant varieties of cane, which, however, were not so desirable as sugar producers. After a time it was thought possible to replace these resistant varieties by some of the older but better sugar producers. When this was done they were once again attacked by the gumming disease, the origin of which was eventually traced to species of native grasses and palms in the bush surrounding the sugarcane areas.

In certain instances it has been observed that within a severely diseased crop there is an area of a few plants which have not been attacked. The reason for this is unknown, but a careful examination of local conditions might reveal the cause of the observed immunity.

In conclusion it is urged that the investigation and control of bacterial diseases is likely to be more effective and achieved more quickly from the combined work of teams consisting of plant breeders, geneticists, pathologists, and biochemists rather than from the efforts of individuals working more or less on their own.

Note for Commonwealth Pathologists

Identification of Pathogens: If facilities are available pathologists should make isolations on the spot and carry out inoculations. Cultures of the reisolated organism which have reproduced the disease should then be sent to C.M.I. by air in

(Continued on p. 46)

Distribution Maps of Plant Diseases

"Give a dog a bad name and hang him" — there is a good deal of truth in this old quip even though the pastime of hanging dogs has gone out of favour in modern times, especially in England. Where records of the occurrence of plant diseases is concerned, however, it is to be feared that Plant Importation Committees and other annoying people not infrequently secrete lengths of rope in convenient filing cabinets in readiness for use on appropriate defaulting dogs.

But not all defaulting dogs are unregenerate. Some seek and have good claims to rehabilitation and a certificate of freedom from hanging: all that is required is a resounding renouncement of sin.

In compiling the C.M.I. disease distribution maps it is a fairly simple operation to pick up records of the occurrence of new diseases, but it is by no means easy to ascertain whether a disease continues to occur in a particular country, or, if not, whether it is safe to assume that it has been eradicated. There are, unfortunately, too many instances of diseases remaining quiescent for many years only to reappear when a change of environment again favours the pathogen.

On the other hand records of the presence of a disease may be based on a single occurrence on a few plants in a strictly limited area, such as a private garden, where official action has been taken and the disease has not been seen again, or the pathogen may have been eradicated by a specifically planned campaign. In such cases it is usual for the department of agriculture concerned to announce the fact without a blare of trumpets or waving of flags. Such modesty is highly commendable, but it does increase the difficulties of the R.A.M. abstractor in spotting such information and thereby having the relevant smirch removed from the map.

An appeal is made to all those concerned with plant disease records to inform the C.M.I. direct when a pathogen is considered officially to have been eliminated from any particular territory, in addition to any announcement published elsewhere, and thereby gain the lasting thanks of the Director and the S's. P.C.A.

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FROM NEAR AND FAR

Research under the A.R.C. in 1957-8 was estimated at £2,033,000 animal; £2,084,000 plants and soils; £350,000 machinery.

Lever Bros. (Rhod.) Ltd. has donated £10,000 to the University College of Rhodesia and Nyasaland. This will provide a Lever Research Fellowship of £650 per annum for male students in chemistry, chemical engineering, or allied subjects. Candidates must be residents or children of residents living in the Federation.

Swollen shoot of cacao has been found in Sierra Leone. The strain of the virus is undetermined but transmission experiments are in progress. A mealybug of a genus different from Pseudococcus njalensis was seen.

The School of Agriculture at Makerere College, the University of East Africa, Kampala, was opened in March by Sir Frederick Crawford. The cost of the building was £83,000 out of an allocation for a Faculty of Agriculture of £250,000 from East African Governments, and £30,000 from C.D. & W. funds.

The National Research Council of Canada announce that the scientific staff numbers 541, including 122 post-graduate fellows and 89 technical staff.

The 10th International Congress of Genetics will be held at Montreal, Canada, from 20-27 August, 1959. Information from Dr. J.W. Boyes, Department of Genetics, McGill University, Montreal.

A Mycological Research Workers' Conference is being held at Simla from 19 to 23 June, 1958, under the auspices of the Indian Council of Agricultural Research. Mycologists and plant pathologists representing various States and central research and teaching institutes in India have been invited to attend, to review the progress in mycological and plant pathological research in the country during 1950-57 and to discuss various pressing plant pathological problems.

Publications of Interest: The NEW ZEALAND JOURNAL OF SCIENCE & TECHNOLOGY has been divided into two, one the NEW ZEALAND JOURNAL OF AGRICULTURAL RESEARCH, Vol. 1, pt. 1 of which was published in February, 1958, the second on general research. The former will appear bi-monthly: annual subscription 30s.

The Shell Petroleum Company commenced the issue of a new periodical SHELL PUBLIC HEALTH AND AGRICULTURAL NEWS (SPAN) in April 1958. Although mainly comprising information on insecticides, there are also articles of general interest for plant pathologists. The set-up is of the usual high order associated with Shell productions.

All past students of the University of London will be interested in the publication of "Convocation in the University of London: The First Hundred Years" by Dr. P. Dunsheath, chairman of Convocation, and Mrs. Margaret Miller (Athlone Press, 1958. 15s.). There is a foreword by H.M. Queen Elizabeth the Queen Mother, the present Chancellor.

"PLANT PATHOLOGY — PROBLEMS AND PROGRESS, 1908-1958", a 1000 page volume of papers presented in international symposia at Golden Anniversary Meeting of American Phytopathological Society, August 24-28, 1958, contains over 60 papers by internationally known scientists and is promised for the autumn of 1958.

The list of Seed-borne Diseases being prepared by the C.M.I. and the International Seed Testing Association in collaboration has now been completed and the index is being prepared prior to production by photo-offset.

CONTROL OF POTATO BLIGHT IN U.K. BY AERIAL SPRAYING

by E. Hainsworth, Plant Protection Ltd.

There is considerable current activity in the U.K. in aerial spraying. In 1957 the total area of agricultural crops sprayed by aircraft was between 50,000 and 60,000 acres, and this is likely to be doubled during 1958. Interest centres chiefly on the control of late blight of potatoes, but the control of sugar beet aphis, pea moth, and pea aphis are also important.

Dusting Superseded

Although aircraft have been used for many years in this country for crop protection the rapid expansion of their use is recent. Before the second world war dusting was the principal way of applying agricultural pesticides from the air. There is now a marked change-over from dusting to spraying, the main reason for this being the considerable economy in load. Spray residues adhere to leaf surfaces better than dust particles, and in addition, dusts are readily blown away from the target area by wind, so that very often an operator has to stop dusting at a wind velocity which would still be suitable for spraying. [1]

Because of this danger from drift, dusting of hormone-type weed killers from aircraft is prohibited in the United States.

Advantage over Ground Spraying

The idea of control of potato blight by fungicides applied from the air is particularly attractive to farmers. It is easy to achieve adequate cover of foliage by ground application early in the season, but there comes a point later on when ground application is no longer practicable. Even if it were possible to continue to achieve thorough cover of the leaf at a time when the haulm has become high and dense, the trailing habit of the stems ensures that considerable damage is done by tractor wheels. Apart from this the displacement of the tops of the plants during the passage of the tractor and sprayer results in a proportion of the upper leaflets being turned over and escaping the spray, thus presenting a surface suitable for the establishment of blight on recovery. As indicated by J.H. Stapley in the last issue of C.P. NEWS, in ground-air comparative trials carried out by Plant Protection Ltd. in Lincolnshire during 1957 it was impossible to take tractor drawn equipment on to the land by the end of July, although no problems were presented in the applications by Bell Helicopter at this time, and the results were outstanding.

Summary of potato blight trial results, Spalding, 1957

Product	Rate per acre	Equipment	Gallonage per acre	Spraying dates July	Percentage blight 26 July	Percentage blight 14 Aug
'Perenox'	3lbs.	Tractor drawn	30	1st, 11th	0·005	60
'Perenox'	3lbs.	Helicopter	3 - 3·6	1st, 11th, 26th	0·005	5
'Perenox'	5lbs.	Tractor drawn	30	1st, 11th	0·005	25
'Perenox'	5lbs.	Helicopter	3 - 3·6	1st, 11th, 26th	0·005	1
Unsprayed (not in trial)	-	-	-	-	0·005	95

Comparative trials organised in 1957 by the FARMERS' WEEKLY in association with the Eastern Region of the National Agricultural Advisory Service aroused widespread interest. In these trials applications of spray and dust by fixed-wing aircraft, and helicopter, were compared with ground applications. These trials were beset from the start by the early appearance of blight, so that the first application was a week late. High winds were encountered at each application.

Unsolved Problems

It is planned to continue the trials on a wider basis during 1958, and the objective is the "scientific comparison of various techniques of application of fungicide to potato haulms"[2]. Many problems remain to be solved; in fact it could be said that with some of them the country is starting from scratch. Answers are thus required on the following main points:-

1. whether helicopters or fixed-wing aircraft are preferable,
2. how the droplet size distribution obtained by air break-up of fluids applied through a spray boom compares in performance with that produced by rotary atomising sprayers,
3. whether fixed-copper fungicides will do better than zineb when applied in identical time-schedules.

A previous detailed experiment organised by the Phytopathological Research Institute, Wageningen, in 1952, in which applications by fixed-wing aircraft were compared with mist-blown ground applications, showed that zineb, cuprous oxide, and copper oxychloride fungicides all gave a degree of blight control by both methods.[3] Dutch practice in timing of sprays and in application rates is, however, so different from that in U.K. that the question requires full examination in U.K. conditions, and the same order of efficiency of the fungicides as in the Wageningen trials (1st cuprous oxide, 2nd copper oxychloride, 3rd zineb) might not then be obtained.

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1. The use of aircraft in agriculture in the U.S.A. - O.E.E.C. Technical Assistance Mission No. 107, Paris, November, 1953.
2. Smith (C.S.). Second Test - air versus ground spraying - Farmers' Weekly, 47, 25, London June 20, 1958.
3. Kerssen (M.C.). Observations on potato late blight control by airplane and atomiser - Instituut voor plantenziektenkundig onderzoek, Wageningen, Onderzoekverslag No. 1; December, 1952.

POTATO WART DISEASE IN ASIA

A report has just been received from the Regional Office for Asia and the Far East (F.A.O.) of the reccurrence of wart disease (Synchytrium endobioticum) of potatoes in a few areas of the Darjeeling district of West Bengal. There is also evidence to suggest that the disease might have appeared in the higher altitute areas of west Bengal adjoining Sikkim in 1956. The variety of potato affected is called Red Round.

Immediate measures have been taken by the Directorate of Plant Protection, Quarantine, and Storage in collaboration with the government of west Bengal to ensure that the disease does not spread to other parts of India.

Students' Day at C.M.I.

On July 2 two parties of students visited the Institute, one from the London College of Pharmacy and Chemistry for Women and the other from the Imperial College of Science and Technology, as well as a number of members of the R.B.G. staff. They were shewn the normal working of the Culture Collection and the Herbarium and were let into the secrets of the production of the REVIEW OF APPLIED MYCOLOGY.

They were given an introduction to plant pathology by the Director who showed a number of colour transparencies of well defined diseases, some of which have been very kindly presented to the C.M.I. by overseas colleagues.

It is hoped to make this an annual event for students.

PERSONAL NEWS

C.M.I. News

The Director has joined a working party to discuss the prevention of the introduction of seed-borne pathogens of tropical and sub-tropical crops to the European Plant Protection Organisation territories. They meet in Paris in July.

Dr. D. Shaw of Papua has been working in the herbarium since April.

Dr. G.M. Wickens of the Empire Cotton Growing Corporation, Namulonge, Uganda, is spending some months working at the C.M.I.

Visitors

Among recent overseas visitors have been: Professor and Mrs. R. Ruggles Gates, Professor C.E. Yarwood and Edgar and Mrs. Vestal, United States; Dr. S.J. Hughes, Canada; Dr. David Ashton, Australia; Dr. G. Scharif, Iran; and A.S. Yadav, Pakistan.

Appointments, Promotions, Retirements etc.

The Overseas Service Division of the Colonial Office announce the following: E.M. Chenery, chief research officer, Uganda; E.J. Honore, Chief Conservator of Forests, Kenya; E.W. Iton, plant pathologist, regional research centre, Trinidad; H.D. Jordan, officer i/c Rice Research Station, Sierra Leone; J. A. Mackenzie, research officer (botany), Nigeria; L. Orieux, plant pathologist, Mauritius.

Dr. F.J. Simmonds has been appointed to succeed Dr. W.R. Thompson as Director, Commonwealth Institute of Biological Control, Canada.

R.G. Fennah has been appointed assistant director of the Commonwealth Institute of Entomology.

Dr. J.M. Watson has succeeded Professor R.T. Leiper as director of the Commonwealth Bureau of Helminthology.

Professor P.H. Gregory, head of the Botany Department, I.C., will succeed F.C. Bawden as head of the Plant Pathology Department of Rothamsted Experimental Station.

Professor C.P. Whittingham of the University of Cambridge has been appointed to the Chair of Botany at Queen Mary College, London.

J.E. Cummings, formerly chairman of C.A.B. Executive Council, has been appointed director, Division of Scientific and Technical Information, International Atomic Energy Agency, Vienna.

Dr. J.D. Ivins has been appointed professor of agriculture at the University of Nottingham from 1 September, 1958.

B.M. Gupta has been appointed lecturer in plant pathology at the Government S.K.N. Agricultural Institute, Jobner, India.

At the invitation of U.S.S.R. Academy of Sciences, Dr. R.S. Vasudeva, Head of the Divisiion of Mycology and Plant Pathology and joint director, I.A.R.I., New Delhi, visited U.S.S.R. during the month of May as a member of an Indian scientists' delegation to see advances in science and technology in that country.

J.C. MacDonald has joined the Prairie Regional Laboratory, Canada, to study mycological chemistry.

Dr. Johanna Westerdijk, for many years director of the Central Bureau voor

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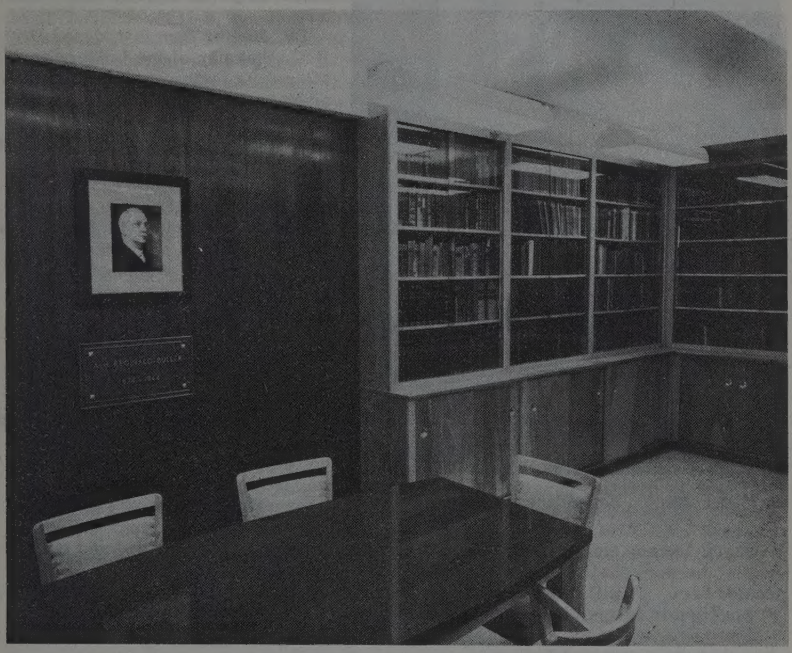
OVERSEAS NEWS

NEWS FROM CANADA



The Buller Memorial

Dr. A.H. Reginald Buller, who was Professor of Botany at the University of Manitoba from 1904 to 1936, built up a splendid personal collection of botanical books — one of the finest personal libraries of his time. The disposal of this library to the Canada Department of Agriculture Research Laboratory by the trustees of Dr. Buller's estate derives from his close connection with the Dominion Rust Research Laboratory, the antecedent of the present laboratory.

Professor Buller died in 1944. The long delay in setting up his library was due to the absence of any fire-proof accommodation. With the erection of the new laboratory building, completed in 1957, it was possible to provide his library with a setting worthy of it where his books may remain secure from the hazard of fire.

The gathering that met on May 30 for the official opening of the Buller Memorial Library was a tribute not only to a great botanist, but also to the man who still lives vividly in the memories of those who knew him. Professor Buller was not a man who is easily forgotten. He is remembered as a brilliant lecturer, in the classroom or on the public platform, as a fearless fighter, in spoken word or in print, for any cause he thought worthy of espousal. By his students he is remembered as an enthusiastic and inspiring director of research. By all who came into contact with him he is remembered for the wit and the charm of his conversation and the broadness of his cultural interests, which included a keen appreciation of music and literature. He was particularly fond of poetry and he had a gift for versification expressed most strikingly in the difficult art of the limerick. By some he will be remembered for generous help given during the formative years of a scientific career.

The Opening was attended by about fifty of Professor Buller's friends: Dr. K.W. Neatby, Director of Science Service, Ottawa, occupied the chair. In his opening remarks he paid a brief tribute to Professor Buller, with particular emphasis on

Dr. Hanna depositing the ashes

the part played by him in the initiation of the rust research work which has been of such great economic importance to Western Canada.

Dr. Neatby then introduced Dr. E.C. Stakman of the University of Minnesota, who gave the principal address. Dr. Stakman spoke of Buller as a dedicated scientist: dedicated to scientific investigation, possessed of perpetual and youthful curiosity and interest in all manifestations of nature, and of the nature of man. The Library is dedicated not as a physical memorial to Buller, who needs none — his name will be remembered as long as men study fungi, which apparently will be for all time! — but to the spirit of curiosity and investigation that motivated him. Buller himself investigated everything that interested him, whenever and however he wished, but he did not disdain problems of economic importance, as indicated by his interest in rust research.

It is appropriate that Buller's personal library should be in this new research laboratory, conceived and built to extend the work that he helped to start, and the building that he helped to have located here. It will be used by men and will inspire men who, although working within certain terms of reference on problems of great economic importance, can attack those problems with the same curiosity, enthusiasm, and intellectual freedom that characterized Buller.

Following Dr. Stakman's address, Dr. T. Johnson, Chief of the Canada Department of Agriculture Research Laboratory, Winnipeg, read several letters which had been sent by friends of Dr. Buller in Britain, Australia, and Canada, who because of distance, or for other reasons, could not be present.

The final event of the occasion, the deposition of Dr. Buller's ashes in a receptacle in the west wall of the library, underneath his portrait, was performed by one of his most distinguished students and intimate friend, Dr. W.F. Hanna, Chief, Botany and Plant Pathology Division, Science Service, Canada Agriculture. Dr. Hanna pointed out how fitting it was that Dr. Buller's ashes should remain with his books which he had accumulated with so much interest and pleasure, and which he had used with such outstanding results in his lifetime.

After the ashes were deposited, the receptacle was closed by a bronze tablet bearing the inscription:

A. H. Reginald Buller,

1874-1944.

Professor Buller's splendid library, which forms an epitome of botanical literature from the days of the herbals to the present time, will remain a memorial to him for generations to come. His greatest memorial, however, will always be the seven volumes of his magnificent "Researches on Fungi".

Dr. P.D. Henning has been nominated as liaison officer for the C.A.B. in the Union of South Africa in place of Dr. P.W. Vorster. His address is Assistant Director of Technical Services, P.B. 116, Pretoria.

NEWS FROM NEW SOUTH WALES

Wallaby Ear Disease of Maize: During the summer months a disease of maize which has become known as "wallaby ear" (Schindler, A.J. 1942. JOUR.AUST. INSTIT.AGRIC.SCI. 8, pp. 35-37) has been highly destructive in maize plantings in coastal areas of northern New South Wales. Affected plants are stunted and take on an upright habit of growth. The leaves are puckered and the veins show irregular swellings, resembling those associated with Fiji disease of sugarcane. The disease is caused by a leafhopper-transmitted virus and it is suspected that dry conditions in the early summer led to migration of leafhoppers from grasses, which had dried off, to green maize crops. Late planted crops were mostly severely affected and the yield reduction of some was estimated at more than 50 per cent.

The disease is currently receiving investigation by N.E. Grylls of the Division of Entomology, C.S.I.R.O., Canberra. The leafhopper vector Cicadulina bimaculata Evans has transmitted the disease to several species of grasses, under glasshouse conditions. Mr. Grylls considers that large areas of grassland in northern New South Wales will be found to harbour the virus.

Vine Diseases in New South Wales: Declining production in several important wine producing districts of New South Wales has reached alarming proportions in the last few years. Preliminary investigations by Dr. Lilian Fraser have established that this is due in part to the presence of a virus disease — leafroll (vide PHYTOPATHOLOGY, 48, pp. 51-54, 1958). Several important wine varieties appear to be almost totally infected. A yellow mosaic disease is also sporadically distributed in wine and table varieties and the sultana. The presence of one or more additional virus disorders is also suspected. A large majority of the diseased vines is grown on Phylloxera-resistant rootstocks and the possible role of these in virus distribution is under review. During October, 1957, Dr. Fraser had an opportunity of seeing leafroll and other grape-vine diseases under California conditions.

Apple Scab Control by Eradicant Spraying: K.E. Hutton reports two further instances of a high degree of control of scab by post-harvest eradicant spraying. Two small isolated orchards in the Tomorrama district of New South Wales, which had a bad scab history, were sprayed with 0·1 per cent. phenyl mercuric chloride in the autumn of 1955. Since then only trace infection has occurred. The autumn treatment was repeated in 1956 and 1957 and no other fungicide has since been used. Close inspection of the orchards in April 1958 indicated that in one orchard, the disease has been eradicated. The previous year a few leaf lesions only on two trees were detected in this orchard. In the other orchard a trace of the disease remains — 6 lightly infected apples were found in 60 bushels of fruit harvested and two infected leaves were detected on one Granny Smith tree. The nearest untreated trees to the orchard are about 3 miles away and in the 1958 season they were heavily infected.

Orchardists in the nearby important apple-growing district of Batlow have followed with interest the experiments at Tomorrama and several have applied a 0·01 per cent. P.M.C. spray this autumn to reinforce their current control programme. This is based on protective fungicides applied under a spray warning system.

Nematodes in Mushroom Compost: Mushroom growing has developed into an important industry in and around the Sydney Metropolitan area during the past decade. Recently, examination of three samples of compost by R.J. Conroy and C. Blake brought to notice for the first time here several species of nematodes. In two cases spawn had disappeared from patches in the beds and in the third the grower had detected a heavy population on the surface of the beds prior to spawning.

Examination of two of the composts revealed a phenomenal population of Ditylenchus destucta, the potato rot nematode, which is known to parasitise spawn, and the third sample was heavily infested with Rhabditis lambdiensis and an undetermined species of Rhabditella. A controlled laboratory experiment has been undertaken to assess the importance of these nematodes in the degeneration of mushroom spawn.

C.J. Magee

NEW ZEALAND NOTES

An Attempt to Control Stem-end Rot of Bananas

The supply of bananas to New Zealand is solely from the Pacific Islands of Tonga, Fiji, and Samoa, where there are few permanent areas of cultivation. Little attempt to control the fungus diseases of bananas has been made there because of the relative ease of planting new areas isolated from the sources of disease infection.

During the summer months in N. Z. it is quite common to see badly spotted and stem-end-rotted bananas, although this was not apparent when the fruit was packed or inspected.

The Plant Diseases Division of the D. S. I. R. in N. Z. was asked by the Samoan Department of Agriculture if they could find a method of controlling this disease — which of course would be to our own advantage!

The trials were willingly commenced and almost perfect control was obtained in the preliminary trials using wound inoculation of the fruit and then spraying them successively with a fungicide and a spore suspension of Gloeosporium musarum and Botryodiplodia theobromae. These two fungi had both been found to be pathogenic on the ripening fruit although Gloeosporium musarum was by far the most prevalent.

An indication of the effectiveness of captan and thiram fungicides can be seen from the results from one trial. The numbers of healthy fruit out of 160 were as follows: captan 155, ferbam 146, thiram 132, water only 91, and copper oxychloride 32.

The reason for the increased disease following the copper oxychloride spray was apparently its effect in hastening ripening thus making the fruit more susceptible to both Gloeosporium and Botryodiplodia. Captan gave a slight russeting and "rubbery" odour to the fruit at concentrations above 1 lb. to 100 gallons and ferbam left a sooty deposit on the fruit, so thiram would probably be the most suitable commercial material.

The results looked so promising that a dipping trial was arranged to be carried out by the Department of Agriculture in Samoa. Only captan was used, at three concentrations: the results after ripening in New Zealand showed that there was no control at all from any concentration. Although the dipping trial should be repeated it seems very likely that Gloeosporium infection occurs while the fruit is green and remains latent until ripening occurs.

Undoubtedly captan and thiram are very efficient fungicides against Gloeosporium, but because of the difficulty in application in the plantation and the danger from the use of mercurial eradicant fungicides it seems that N. Z. will have 'spotty' bananas for some years to come.

Personal News

Miss Joan M. Dingley, has returned from her visit to the United Kingdom and Europe. Her particular task was checking the taxonomic work that she had been doing in New Zealand. She spent most of her time at the C. M. I. and then made a short visit to the Natural History Museums in Paris and Stockholm.

Dr. Frank Newhook visited the U. S. A. during the latter part of 1957. His main interest was in the Phytopthora spp. parasitic on Pinus radiata. He was also able to see the Phytophthora problems of pineapple growing in Hawaii with Dr. Anderson on his return.

Dr. Harvey C. Smith made a short visit to Australia in December to investigate the possibility of obtaining dry-rot (Phoma lingam) free Brassica seed. Although the main suitable areas in South Australia and Tasmania were visited the prospects were not promising. Even in South Australia, where the rainfall for the previous 12 months was only 14 inches, dry-rot infection of siliquas and seed was prevalent on two of the four crops inspected. The infection had apparently been spread by insects which of course does offer better prospects for control. Ample residues with the perfect stage, Leptosphaeria maculans, were found in previous seed crop areas.

Dr. J.D. Allen has been appointed to the position of mycologist at the Plant Diseases Division, Field Crop Section at Lincoln. He was previously with the W.A.I.F.O.R. and was in charge of the substation at Ibesit. His work at Lincoln will be the investigation of seed-borne diseases of field crops, particularly brassicas and peas.

H.C. Smith

NEWS FROM INDIA

Some interesting results obtained recently at the Indian Agricultural Research Institute are reported below:-

Loose Smut of Wheat (Ustilago nuda): Soaking the infected seed of a highly susceptible wheat variety NP 775 in copper-free distilled water for 23-29 hours at 30°C, and 41-48 hours at 25°C, rendered the mycelium within the seed non-infective, but soaking the seed at 20°C. even up to 53 hours did not appreciably reduce the incidence of the disease.

Sugarcane Red Rot (Glomerella tucumanensis): Studies in the mutations of this organism with the help of radio-active isotopes have shown wide variation in morphological features and nutritional requirements. Morphological mutants of this organism have already been reported (C.P.NEWS, 3, 2, p. 28, 1957). Among the latter, stable mutants showing deficiencies for vitamins like para-aminobenzoic acid, nicotinic acid, and biotin have been screened. The parent culture does not require the addition of these vitamins in the medium for its growth.

Tristeza of Citrus: Further tests on the insect transmission of the virus revealed that the virus could be successfully transmitted by Toxoptera citricidus from diseased grape fruit (Citrus medica), Kagzi lime (Citrus aurantifolia), and mosambi (Citrus sinensis) to West Indian Key lime and Aegelopsis chevaliari.

R.S. Vasudeva

NOTES FROM PAKISTAN

Awards

Dr. Taskhir Ahmad, Director, Department of Plant Protection, Karachi, (Pakistan) and a Liaison Officer for C.A.B. for Pakistan, has been awarded the TAMGHA-I-QUAID-I-AZAM Class I in the Pakistan Republic Day's Honours List. This is in recognition of his services rendered in the field of Plant Protection.

Appointments

H.M. Abbas and Dr. Syed Bazley Ali have been appointed deputy director (technical) and plant pathologist, respectively, in the Department of Plant Protection, Karachi.

Jute Research

Mr. C.K. Reheem, Scientific Liaison Officer for Pakistan, is anxious to obtain information about current research on the pathology and breeding of jute and would welcome contacts with research institutions. His address is Pakistan Scientific Liaison Office, Africa House, Kingsway, London, W.C.2.

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NEWS FROM AFRICA

NYASALAND

The Tobacco Season

The season got off to a bad start with the introduction of anthracnose (Colletotrichum tabacum). The original outbreak of this disease in a flue-cured tobacco nursery was closely followed by four further outbreaks over a wide area. Investigation of these showed that the seed all came from one source. Thus very strong circumstantial evidence was obtained that the disease was seedborne, and experimental evidence in support of this has now been obtained by Dr. Bates in Salisbury, Southern Rhodesia. A few further outbreaks have since occurred, and one case has recently come to light of anthracnose in mature tobacco in the field. This has evidently been the result of secondary spread, as no anthracnose was reported from this farmer's seedbeds, but his neighbour had one of the original five outbreaks.

A very serious view is taken of anthracnose in Nyasaland, because of the danger to the large African fire-cured tobacco industry. Susceptibility of the crop has been established, but owing to the way in which it is grown control methods as practised in flue-cured nurseries would be impracticable. The tobacco is produced exclusively on small holdings, with some 62,000 growers producing about 21,500,000 lbs. of leaf off approximately 110,000 acres. These small holdings are widely scattered over the country wherever there is suitable soil at elevations of 3,000 - 3,500 ft., with equally scattered nurseries. None but a few of the larger growers would be able to afford to buy their own sprayers and fungicides, and organisation of the financing, distribution, and supervision of the use of spray machinery and fungicides would be very difficult. It is hoped, therefore, during the coming season, to conduct an intensive campaign on the flue-cured estates where the disease is known to have occurred in order to prevent spread of the disease to the African nurseries.

Scab, caused by Septomyxa affinis was found to be the only disease in dark-fired tobacco seedbeds in the Central Province, in some cases being so serious as to wipe out several beds. Turkish tobacco appears to be particularly susceptible to this pathogen, as observations over two seasons in different localities indicate.

In the field, weather conditions have been particularly unhelpful this year. A very late start to the rains meant that much of the early dry-planted tobacco died before the rain came, and had to be replanted. Virtually continuous rain and overcast conditions for the months of December, January, and February have caused a uniformly low flowering height, and widespread development of leaf spot caused by Cercospora nicotianae has caused the abandonment and ploughing in of the whole of one farmer's crop this season, where not one dry day was experienced in February while the leaf was ripening. An unusual manifestation of this disease this season has been the extensive production of stem lesions.

Alternaria longipes is a fungus still to be feared, particularly in the Kasungu district, where it has in the past wrought considerable damage. It still appears in the district, and one one estate this year has assumed epidemic proportions.

A new record of some interest is the appearance of Fusarium wilt (due to Fusarium oxysporum f. nicotianae) on Burley tobacco in the Lilongwe district. It appeared on eelworm-affected plants on newly opened land.

D.C.M. Corbett

(Continued from p. 35)

screw cap bottles or small Durham tubes containing nutrient agar. It is a waste of time to send impure cultures. If inoculation experiments cannot be done and a number of isolations have been made, each should be sent separately.

Classification and Nomenclature: The system given in Bergey's Determinative Bacteriology, 8th Edition, 1957, is now in general use and has adopted the generic names employed by the writer with the exception of his Pectobacterium for the true soft rot bacteria for which Bergey uses Erwinia, although the name Pectobacterium is referred to in the footnotes on pp. 349-50.

INTERNATIONAL MEETING OF SEED PATHOLOGISTS

The first international meeting of seed pathologists was held in Cambridge during the week commencing May 12 under the auspices of the International Seed Testing Association. At the invitation of Dr. Neergaard the following attended and spent a most instructive and enjoyable week demonstrating and comparing techniques at the N.I.A.B. laboratory, where facilities were kindly provided by the director, Dr. Horn.

Antonio Ferreira Florencio, Mrs. Maria de Lourdes Florencio, Lisboa, Portugal; Dr. J.C.F. Hopkins, CMI., England; Dr. Maria Kietreiber, Vienna, Austria; Dr. Gillian M. Marshall, Cambridge, England; Dr. I.P. Malone, Professor A.E. Muskett, Belfast, Northern Ireland; Dr. Joan F. Moore, Harpenden, England; Dr. Paul Neergaard, Copenhagen, Denmark; Dr. Mary Noble, Edinburgh, Scotland; Dr. J. Ponchet, Versailles, France; Dr. J. de Tempe, Wageningen, Holland.

(Continued from p. 40)

Schimmelcultures, Baarn, Holland, has retired.

Awards

Dr. W.A. Sexton and W.G. Templeman of I.C.I. have been awarded the Research Medal of the Royal Agricultural Society of England for their researches on selective herbicides, leading to the discovery of such well-known substances as 2,4-D and isopropyl phenyl carbamate.

Dr. P.O. Wiehe, Mauritius, was awarded a C.B.E. in the last Birthday Honours.

C.V. Subramanian has been awarded the D.Sc. degree of the University of Madras for his work on Hyphomycetes.

Officers of the Linnean Society, 1958-9

President: Dr. C.F.A. Pantin
Treasurer: The Earl of Cranbrook
Secretary (Zoology): Professor H.R. Hewer
(Botany): Dr. C.R. Metcalfe
New Members of Council: J.P.M. Brennan, Earl of Cranbrook, Dr. J.L. Harley, Dr. W.G. Templeman, Dr. H.G. Vevers.

Officers of the Association of Applied Biologists, 1958-9

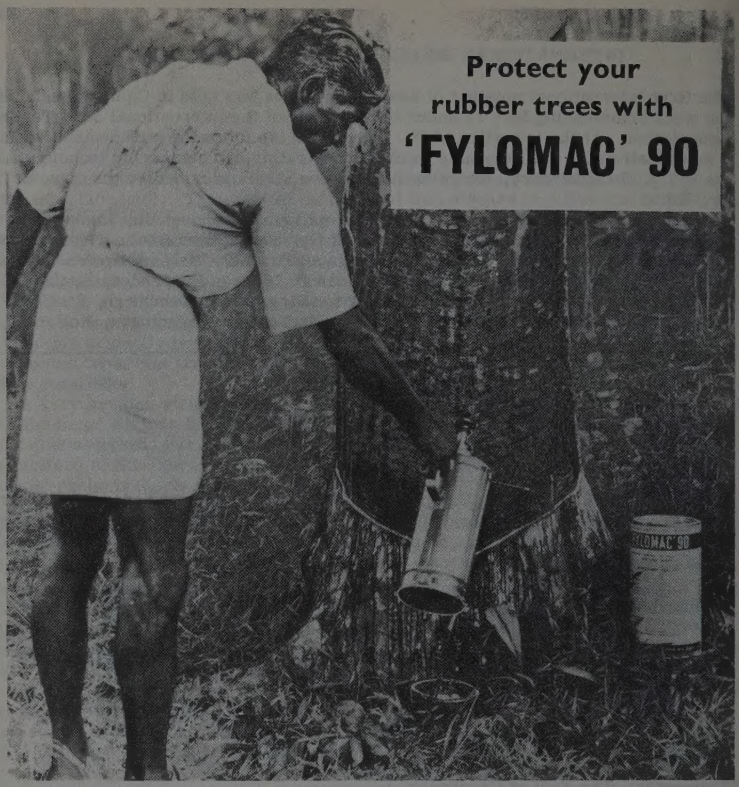
President: Dr. I. Thomas
Vice-President: Miss A.P. Wilson
General Secretary: Dr. L. Broadbent
Treasurer: Dr. H.F. Barnes
Editor: R.W. Marsh
New Council: Dr. C.C.V. Batts, Professor A.H. Bunting, J. Hobart, Dr. J.H. Western.

Royal Society

The following have been elected Fellows: Dr. P.W. Brian, head of Akers Research Laboratories of I.C.I., and Dr. W.B. Turrill, former Keeper of the Herbarium, R.B.G., Kew.

Correction

In the issue of January 1958 it was stated that Miss E.M. Turner had been appointed lecturer in botany as St. Anne's College, Cambridge. This, of course, should read St. Anne's College, Oxford.



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